OUTLINE SHEET 3-8-1
Piping System Tracing Laboratory

A. Introduction

Tracing a piping system hand-over-hand is an effective method of learning the system. Tracing the piping system in the PSAL laboratory will prepare you for its operation.

B. Enabling Objectives

3.23 **TRACE** assigned piping system.

C. Topic Outline

1. Introduction
2. Overview
3. Water Supply System
4. Cooling Water System
5. Water Transfer System
6. Water Drain System
7. Laboratory Exercise
8. Summary and Review

ASSIGNMENT SHEET 3-8-2
Piping System Tracing Laboratory

A. Introduction

This material is to be completed prior to the material being covered in class.

B. Enabling Objectives

Refer to enabling objectives in Outline Sheet 3-8-1.

C. Study Assignment

1. Read Information Sheet 3-8-3

D. Study Questions

None

INFORMATION SHEET 3-8-3
Piping System Tracing Laboratory

A. Introduction

This information describes components of the piping system at PSAL.

B. Reference

None

C. Information

I. Piping - An assembly of pipe or tube, including fittings and inline components.
   A. It is normally used with devices such as valves and strainers, that are used for conveying fluids.
   B. The piping system includes the piping, pumps, heat exchangers, compressors, and other fluid-containing items.
   C. It does not include major equipment or components.

II. Water Supply System - supplies water to the jet pumps.
   A. Pump suction valve - stops and starts the flow of water into the suction side of the pump.
   B. Centrifugal pump - utilizes the throwing force of a rapidly revolving impeller.
   C. Recirculation valve - stops and starts the flow of water in the recirculation line from the discharge side of the pump back to the suction supply.
   D. Vent valve - allows the air in the pump casing to escape in order to prime the pump.
   E. Swing check valve - allows the flow of water in only one direction.
   F. Suction gage - used to monitor the pressure or vacuum in the suction side of the pump.
   G. Discharge gage - used to monitor the pressure on the discharge side of the pump.

III. Storage tank - used to store liquid for future use.
   A. Sight glass - used to monitor tank level.
   B. Tank level alarm - alerts personnel to abnormal tank level.

IV. Cooling Water System
   A. Pressure reducing valve - reduces supply pressure to a specified lower and constant discharge pressure.
   B. Inlet valve - starts and stops the flow of fluid into the pressure reducing valve.
   C. Outlet valve - starts and stops flow of fluid from pressure reducing valve.

D. By-pass valve - allows the fluid to bypass the pressure reducing valve.
E. Relief valve - automatically opens to relieve excess pressure when the pressure becomes too high.
F. Heat exchanger - allows the transfer of heat from one fluid to another.
    1. Heat exchanger vent valve - allows air to be vented from the heat exchanger.
    2. Drain valve - allows fluid to be drained from the heat exchanger.
    3. Cooling water inlet valve - stops and starts the flow of cooling water into the heat exchanger.
    4. Cooling water outlet valve - stops and starts the flow of water from the heat exchanger.
    5. Heat exchanger outlet valve - stops and starts the flow of fluid from the heat exchanger.

V. Water Transfer System - transfers water from one tank to another.
A. Tanks - used to store liquids.
B. Tank outlet valve - starts and stops the flow of fluid from the tank.
C. Cross-connect valve - connects or isolates one tank to/from another.
D. Pump suction valve - starts and stops flow of fluid into the suction side of the pump.
E. Rotary pump - positive displacement pump.
F. Pump discharge check valve - spring-loaded check valve.
G. Pump discharge valve - starts and stops flow of fluid out of the discharge side of the pump.
H. Tank inlet valve - solenoid operated valves.
I. Tank inlet valve control panel - operates inlet valves grouped using electrical signals.
J. Hose connection valve - valve with hose connection.

VI. Water Drain System - collects and transfers drains from various systems.
VII. Collecting tank - receives drains from other systems.
VIII. Water supply valve - starts and stops the flow of water supply to the eductor.
A. Eductor - uses the rapid flow of a fluid to entrain another fluid.
B. Eductor (overboard) discharge valve - stops and starts flow of fluid from the discharge side of the pump.
C. Eductor suction valve - starts and stops flow of fluid to the suction side of the pump.
D. Water supply gage - indicates water supply pressure to the eductor.
E. Eductor suction gage - indicates if vacuum is formed at the suction side of the pump.
F. Tank suction valves - starts and stops flow of fluid from the tank into the suction side of the pump.